

SEA



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Compiled and edited by Pat
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How to Hide in the Ocean

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Topic: Marine Biology

Grade Level: K - 8

Summary: Students will observe and discuss the advantages of camouflage, then try their hands at designing a well-camouflaged fish.

Key Words: camouflage, countershading, transparent, opaque, wavelengths of light, photophore

Introduction: In the three-dimensional ocean, some creatures live on the sea floor, but many live and move about in the water column. Having a body form that is hard to see or detect helps many ocean dwellers avoid being eaten by hungry predators. However, many predators have evolved some of the same adaptations which help them approach their prey without being seen. Some of the adaptations for hiding in the ocean include:

ADAPTATION	EXAMPLES
<p>Small Size Small size makes visual detection difficult. A disadvantage of small size is the inability to move quickly over distances.</p>	<p>- Phytoplankton -Zooplankton</p>
<p>Transparent Body In the photic (light) zone of the ocean, many of the zooplankton are transparent. In addition, many organisms, such as fish and crabs, which later have body coloration are transparent in their vulnerable juvenile forms.</p>	<p>-Jellyfish -Salps -Larval fish -Shellfish</p>
<p>Cryptic Coloration Many fish have dark coloration on their dorsal (top) sides and shading to light coloration on their ventral sides. Seen from above, they blend with dark waters below; seen from below, they blend with light from the sky</p>	<p>-Cod -Tuna -Dolphin</p>
<p>Disruptive Coloration This type of camouflage helps hide the outline of the fish, especially if its habitat includes a variety of shapes and colors. The coloration of the clown anemone fish is helpful for its coral reef habitat, but would make in conspicuous in the open ocean.</p>	<p>-Clown anemone - Fish</p>

<p>Mimicry of Surrounding Some organisms are colored and shaped to appear part of the surrounding habitat. Some flatfish can even change their color by altering the distribution of pigment in specialized cells called chromatophores.</p>	<p>-Flounder -Sargassum fish</p>
<p>Bioluminescence Some mid-water fishes have specialized cells called photophores which can emit light. In lantern fish, these cells are arranged along the ventral or bottom side. It is thought that in dimly-lit waters the bioluminescence from these cells helps mimic the faint light reaching mid-water from above.</p>	<p>-Lantern fish</p>

What to Expect: You can introduce this activity using only fish, which are familiar to students, and then expand it to include a wide range of invertebrates found in the ocean. For younger children, verbal discussion will reinforce the concept; reintroduce it during the year when studying different animals and their adaptations. For older students, it would be appropriate to assign a brief research project on camouflage in marine animals. Have students use print, CD, and internet sources for information.



PART I: How to Hide in the Ocean

Materials:

- Two double pages of newspaper with lots of text colored paper or construction paper, 2 or 3 different colors
- Scissors and glue
- Many pictures of fish and other ocean organisms
- Tape

Procedure:

1. Cut out three fish each of red, blue, and green construction paper.
2. Cut three fish out of the second sheet of newspaper text.
3. Adhere all the fish to the first page of newspaper, hiding the newsprint fish as well as possible.
4. Tape your creation to an opaque wall. Have it covered

- before the students enter the room.
5. Tell the students that their job is to count the fish and they will have 20 seconds in which to do this. Recover your creation.
 6. Have a discussion on how many fish, and how many kinds of fish are on the paper. This is a good time to move the paper over in front of a source of light and begin a discussion on which fish will be the last ones eaten and why.
 7. Show a few of the pictures of ocean creatures and have students discuss how they keep from being seen.
 8. Pass out the pictures and have students complete a response sheet for their organism.

PART II: Students develop and hide a camouflaged fish

Materials:

- Colored paper or construction paper
- Clear plastic sheets for making transparent fish (optional)
- Markers
- Crayons
- Scissors
- Tape

Procedure:

1. Divide students into pairs or groups of three. Assign each group a letter.
2. Each group is to create a fish that can be placed in plain view in the classroom and not be seen by the other teams. Fish must be a minimum of 15 cm x 5cm.
3. Allow class time for the examining of the room for a good location for each team's fish and time for the creation of the fish.
4. All the students must leave the room while each team hides its fish. Teams should take turns entering the room and placing their fish, then going out.
5. When all the fish are hidden, call the class back in.
6. Two or three minutes is enough time for the fish hunt.
7. Each student should mark on a map of the classroom where each fish is placed.
8. Tally the number of students who found each fish. The best-hidden fish (fewest times seen) wins a prize.
9. As an evaluation, ask the student teams to describe their fish's adaptations to its classroom habitat.

Evaluation: Response sheets (or discussion for younger students), description of own camouflaged fish's adaptations for hiding in classroom "habitat," and reasonable hiding place for own camouflaged fish

Extensions: Have students use water, food coloring, and colored materials (such as plastic or wood math manipulative blocks) to experiment with how ocean color might influence the evolution of camouflage colors.

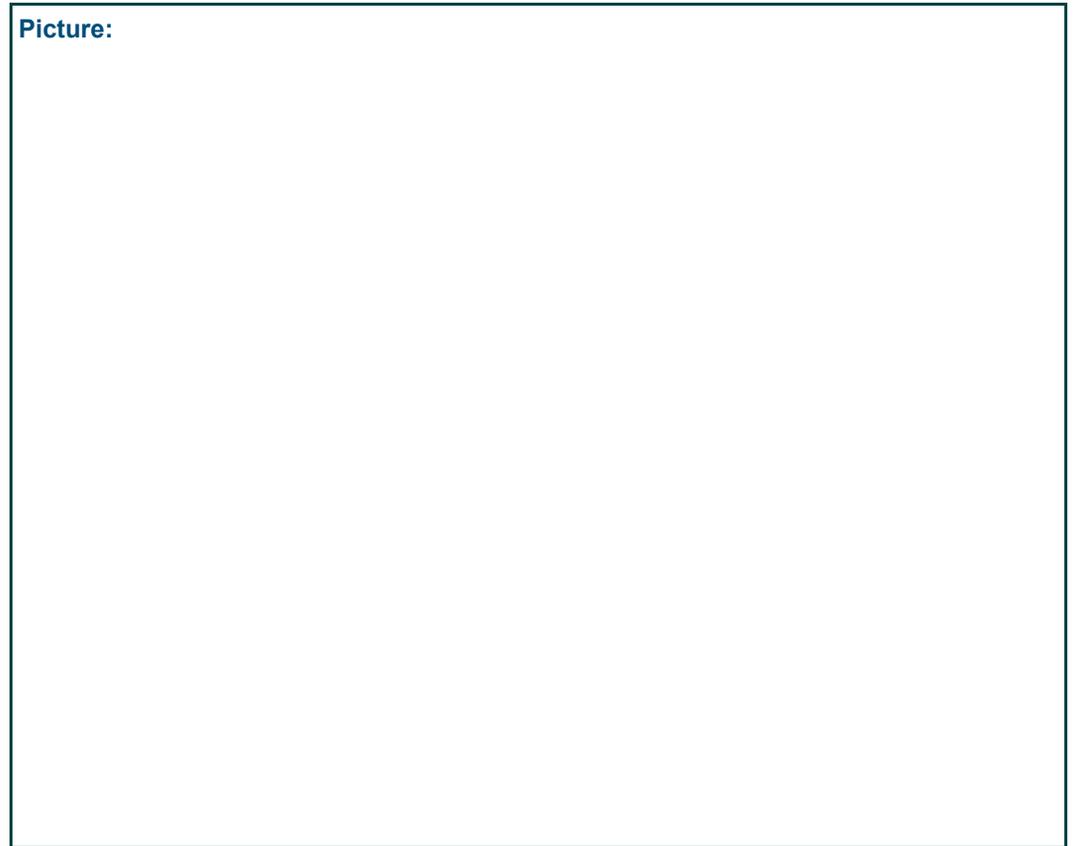
Supplements:

STUDENT RESPONSE SHEET

Name of marine creature:

Draw a diagram (a picture with labels) to show your creature's adaptations for hiding in the ocean.

Picture:



How does the adaptation help it hide?

Resources:

Marine Biology Coloring Book, Thomas Niesen. 1982, Harper & Row Publishers.

Fashion a Fish, Project with Aquatic, Western Regional Env. Ed. Council. 1987.

Fish Adaptations, in The Ocean Book, 1989. Center for Marine Conservation. John Wiley & Sons, Inc., New York.

Fish pictures website: [Bridge-Bony Fishes](#),.

Source: Based on an idea by Sherill Caruana, SEA Experience

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